

**WHAT IS CLAIMED IS:**

1. An internet protocol (IP) address managing apparatus, comprising:  
a switch unit that searches for an idle IP address among a plurality of IP addresses stored in a database to allocate the idle IP address to an internet connection system; and  
an IP service network unit connected to said switch unit and having at least one router for a LAN-to-LAN connection.

2. The IP address managing apparatus of claim 1, wherein said switch unit comprises:

a call processing unit that determines if a call requires the idle IP address and performs a call process to said internet connection system when a subscriber attempts the call;

a number translating unit connected with said call processing unit that translates a destination number inputted from the subscriber;

a database connected to said call processing unit to manage the plurality of IP addresses;  
and

the internet connection system unit connected to said database that requests an IP address allocation for connection with said IP service network and returns the IP address allocation to said database when the call is released.

3. The IP address managing apparatus of claim 1, wherein each record of the database corresponds to one of the plurality of IP addresses and each record comprises:

fields A, B, C and D that specifically discriminate the corresponding IP address;

a flag indicating a validity or invalidity of the corresponding IP address; and

a use structure that indicates if the corresponding IP address is being used currently.

4. The IP address managing apparatus of claim 1, wherein said database searches for the idle IP address, under the control of a call processing unit, when said internet connection system requests the call processing control unit to allocate the idle IP address.

5. The IP address managing apparatus of claim 2, further comprising an IP management unit in said call processing unit for managing the plurality of IP addresses in said database.

6. An apparatus for managing internet protocol (IP) addresses, comprising:  
an IP service network unit having a router for a LAN-to-LAN connection; and  
a switch unit that connects a subscriber to said IP service network, controls a call inputted from said subscriber, searches and allocates an idle IP address in a database according to an IP address allocation request from an internet connection system, and returns a currently used IP address to the database and sets the currently used IP address to be reused, according to an IP return request from said internet connection system.

7. The apparatus of claim 6, wherein said switch unit comprises:

a call processing unit that judges if the call requires an IP address to perform a call process to said internet connection system, when a call connection is attempted by said subscriber;

a number translating unit connected to said call processing unit that translates a destination number inputted from said subscriber;

the database connected to said call processing unit that manages the IP address; and

the internet connection system unit connected to said database that sends the IP address allocation request to said database and returns the IP address to said database when the call is released.

8. The apparatus of claim 6, wherein each record of the database corresponds to one of a plurality of IP addresses and each record comprises:

fields A, B, C and D that specifically discriminate the corresponding IP address;

a flag indicating a validity or invalidity of the corresponding IP address; and

a use structure that indicates if the corresponding IP address is being used currently.

9. The apparatus of claim 6, wherein said database searches for the idle IP address, under the control of a call processing unit, when said internet connection system requests the call processing control unit to allocate the idle IP address.

7.03250 "E-H79550

10. An IP address managing method, comprising:  
connecting to an internet connection system identified by a destination number;  
requesting IP address allocation from a call processing unit for the internet connection  
system;  
searching for an idle IP address in a database; and  
transmitting the idle IP address to the internet connection system.

11. The IP address managing method of claim 10, further comprising connecting  
a subscriber to an IP service network.

12. The IP address managing method of claim 11, further comprising requesting a  
call termination by the subscriber.

13. The IP address managing method of claim 12, further comprising:  
sending a call release request to the call processing unit from the internet connection  
system; and  
releasing a call from the internet connection system and the IP service network.

14. The IP address managing method of claim 13, further comprising returning the idle IP address to the database, under the control of the call processing unit.

15. The IP address managing method of claim 14, wherein a flag and a use of the idle IP address are reset according to an IP address status, when the idle IP address is returned to the database.

16. The IP address managing method of claim 15, wherein the flag is set to a value of F and the use is set to a value of No, when the idle IP address is returned to the database due to a fatal error, and the flag is set to a value of T and the use is set to a value of No when the idle IP address is returned for a reason other than the fatal error.

17. The IP address managing method of claim 10, wherein an idle IP address list is managed in the database and searched under the control of the call processing unit.

18. The IP address managing method of claim 10, wherein the call processing unit has an additional control unit that searches for the idle IP address in the database.

19. The IP address managing method of claim 10, wherein the idle IP address is identified by state values of a flag and a use of the idle IP address.

20. An internet protocol (IP) switching system, comprising:

a database that stores management information regarding IP addresses assigned to the switching system; and

a call processor for processing a call from a subscriber and for interconnecting the subscriber with one of a number of internet connection systems, based on call information within the call, wherein

the call processor maintains a record of idle IP addresses, which are not allocated, and active IP addresses, which are allocated to a number of active calls, within the database.

21. The switching system of claim 20, further comprising a number translation unit that translates a number within the call information to an identification of a corresponding internet connection system, of the number of internet connection systems.

22. The switching system of claim 20, further comprising:

an IP address record, stored in the database, corresponding to each of a number of IP addresses assigned to the switching system and each IP address record contains a Flag field and a Use field, wherein

the Flag field is set to first value indicating invalidity of the corresponding IP address, if the corresponding IP address is returned to the database due to a fatal error,

the Flag field is set to second value indicating validity of the corresponding IP address, if the corresponding IP address is returned without the fatal error,

the Use field is set to a true value, if the corresponding IP address is currently allocated to an active call, and

the Use field is set to a false value, if the corresponding IP address is not currently allocated to an active call.

23. The switching system of claim 20, wherein the call processor unit searches the database for the idle IP addresses and assigns one of the idle IP addresses to the one internet connection system.

24. A method of managing internet protocol (IP) address allocation in a switching system, comprising:

allocating an idle IP address to an internet connection system when a subscriber requests access to the internet connection system; and

indicating in a database record corresponding to the allocated IP address that the allocated IP address is active.

25. The method of claim 24, further comprising:

indicating in the corresponding database record that the IP address is idle when returned by the internet connection system.

26. The method of claim 24, further comprising:

identifying one of a number of internet connection systems, based on a number received in call information from the subscriber;

connecting the subscriber and the one internet connection system; and

sending an IP address request from the one internet connection system to a database.

27. The method of claim 24, further comprising:

identifying one of a number of internet connection systems, based on a number received in call information from the subscriber;

connecting the subscriber and the one internet connection system;

sending an IP address request from the one internet connection system to a database;

and

searching the database, which stores an IP address record for each of a number of IP addresses assigned to the switching system, for one of a number of idle IP addresses that is not currently allocated to the number of internet connection systems.